

WHAT IS CLAIMED IS:

1. A laser desorption ionization mass spectrometric method, which applies a laser beam to a sample placed on a sample plate attached to a mass spectrometer so that the sample is ionized and then analyzed,
5 comprising the steps of:

adsorbing a sample on a membrane which has been affixed on a flat metal plate of the sample plate;

applying a reagent to the adsorbed sample on the membrane to subject
10 the sample to a modifying reaction; and

analyzing the sample through a laser desorption ionization mass spectrometric method by attaching the sample plate after the modifying reaction to a mass spectrometer.

15 2. The laser desorption ionization mass spectrometric method according to claim 1, further comprising the step of;

prior to attaching the sample plate to the mass spectrometer after the modifying reaction, applying a matrix solution to the adsorbed sample,

wherein, in the analyzing step, the ionizing process is carried out
20 through a matrix-assisted laser desorption ionization method.

3. The laser desorption ionization mass spectrometric method according to claim 1, wherein the adsorbing step of the sample onto the membrane is carried out through a method in which a medium on which the sample is
25 developed is superposed on the membrane on the sample plate and a voltage is applied between the medium and the membrane so that the sample is transferred onto the membrane from the medium.

4. The laser desorption ionization mass spectrometric method according
30 to claim 1, wherein the sample to be adsorbed on the membrane is at least a

material selected from the group consisting of proteins, peptides, saccharides, lipids, nucleic acid molecules and a mixture thereof.

5 5. The laser desorption ionization mass spectrometric method according to claim 4, wherein the sample is separated by a method selected from the group consisting of two-dimensional electrophoresis in which isoelectric focusing electrophoresis and SDS polyacrylamide electrophoresis are combined, SDS polyacrylamide electrophoresis and other chromatography methods.

10 6. The laser desorption ionization mass spectrometric method according to claim 1, wherein the modifying reaction is a reaction caused by an enzyme selected from the group consisting of proteolytic enzyme, glycolytic enzyme, nuclease and a combination thereof.

15 7. The laser desorption ionization mass spectrometric method according to claim 1, wherein the membrane is at least a polymer selected from the group consisting of PVDF, nitrocellulose, nylon (registered trademark) and derivatives thereof.

20 8. The laser desorption ionization mass spectrometric method according to claim 1, wherein the sample adsorbed on the membrane is visualized on the membrane.

25 9. The laser desorption ionization mass spectrometric method according to claim 8, wherein the visualizing process is carried out by using at least a material selected from the group consisting of a bio-sample, a color-developing reagent, a fluorescence reagent, metal, ultraviolet rays and a combination thereof.

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10. A sample plate comprising:
a flat metal plate; and
a membrane being affixed in the flat metal plate.

5 11. The sample plate according to claim 10, wherein the metal plate has
a homogeneous flat face and the membrane is closely made in contact with
the flat face of the metal plate to be affixed thereon with a conductive
substance interpolated in between.

10 12. The sample plate according to claim 11, wherein the conductive
substance is a conductive double-sided tape.

15 13. The sample plate according to claim 10, wherein the membrane is at
least a polymer selected from the group consisting of PVDF, nitrocellulose,
nylon (registered trademark) and derivatives thereof.

14. The sample plate according to claim 10, wherein the sample plate is
compatibly used as a plate used for mass spectrometry.